

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Aeronautics and Astronautics

16.36: Comm. Sys. Engineering
Problem Set No. 4

Date Issued: march 4, 2003
Date Due: March 11, 2003

Text Problems: 7.1, 7.8, 7.42, 7.43, 7.46

Hints:

7.1: notice that $A_m = (2m-1-M)d/2$

7.42: For the $M=8$ constellation you will need your trigonometric laws of sines and cosines. For the probability of error just consider the power required to keep adjacent symbols at the same distance under both constellations.

7.46: You will need trigonometry here again. Solve first for a by considering the nearest neighbors for the inner circle. Once you obtain a , notice that the nearest neighbors for the outer circle are the two closest inner circle points, not the other outer circle points.